1. A characteristic value identification method comprising:

a first process for preparing a functional model of a part based on a potential quantity and a flow quantity representing energy applied to the part,

a second process for converting the functional model into a steady functional model in a steady state to identify a steady internal characteristic value, and

a third process for identifying a transient internal characteristic value of the functional model in a transient state by using the steady internal characteristic value.

2. The characteristic value identification method as claimed in claim 1 wherein the second process includes;

a first step for determining an internal characteristic value of at least one steady test model from the steady functional model,

a second step for collecting steady test data by performing a test corresponding to the steady test model, and

a third step for identifying a steady internal characteristic value of the internal characteristic value based on the steady test data.

3. The characteristic value identification method as claimed in claim 2 wherein the first step determines the internal characteristic value from a government equation in the steady state of the functional model.

4. The characteristic value identification method as claimed in claim 3 wherein the third step converts the government equation into a recurrence equation to determine the steady internal characteristic value from a recurrence coefficient of the recurrence equation.

5. The characteristic value identification method as claimed in claim 2 wherein the third step divides the steady internal characteristic value into a known factor and an unknown factor to identify the steady

internal characteristic value of the unknown factor.

6. The characteristic value identification method as claimed in any one of claims 1 to 5 wherein the third process includes;

a first step for determining an internal characteristic value of at least one transient test model in a transient state of the functional model,

a second step for collecting transient test data by performing a test corresponding to the transient test model,

a third step for applying the steady internal characteristic value to the internal characteristic value of the transient test model to generate transient phenomenon reproduction data, and

a fourth step for correcting the transient phenomenon reproduction data based on an error between the transient phenomenon reproduction data and the transient test data, thereby identifying a transient internal characteristic value.

7. The characteristic value identification method as claimed in claim 6 wherein when the error does not lie within an allowable range the fourth step repeatedly corrects a predetermined transient internal characteristic value within the transient phenomenon reproduction data until the error lies within the allowable range, and determines the transient internal characteristic value to be identified when the error lies within the allowable range

8. The characteristic value identification method as claimed in claim 7 wherein the fourth step preliminarily calculates a variance deviation, as a time history sensitivity, to an initial value at a time when each transient internal characteristic value is increased or decreased at a fixed ratio, and selects a transient internal characteristic value having a maximum sensitivity within the time history sensitivity as the predetermined transient internal characteristic value.

9. The characteristic value identification method as claimed in claim 7 wherein the fourth step preliminarily calculates a variance deviation,

as a time history sensitivity, to an initial value at a time when each transient internal characteristic value is increased or decreased at a fixed ratio, and selects a transient internal characteristic value having the time history sensitivity similar to the error as the predetermined transient internal characteristic value.

10. The characteristic value identification method as claimed in claim 9 wherein the fourth step simultaneously selects a plurality of transient internal characteristic values having different maximum sensitivity times as the predetermined transient internal characteristic value.

11. A characteristic value identification apparatus comprising:

block replacement means for a functional model of a part prepared by a potential quantity and a flow quantity representing a strength and a quantity of energy applied to the part,

test reproduction means for reproducing at least one steady test model in a steady state of the functional model and at least one transient test model in a transient state,

testing means of the part for performing a steady test and a transient test respectively corresponding to the steady test model and the transient test model,

measurement means for collecting steady test data and transient test data at a time when a steady test and a transient test of the part are performed by the testing means, and

calculating means for identifying a steady internal characteristic value of the steady test model by using the steady test data, for applying the steady internal characteristic value to the transient test model to generate transient phenomenon reproduction data, and for correcting the transient phenomenon reproduction data based on an error between the transient phenomenon reproduction data and the transient test data, thereby identifying a transient internal characteristic value.

12. The characteristic value identification apparatus as claimed in claim 11 wherein when the error does not lie within an allowable range the calculating means repeatedly correct a predetermined transient internal characteristic value within the transient phenomenon reproduction data until the error lies within the allowable range, and determine the transient internal characteristic value to be identified when the error lies within the allowable range

13. The characteristic value identification apparatus as claimed in claim 11 wherein the calculating means preliminarily calculate a variance deviation, as a time history sensitivity, to an initial value at a time when each transient internal characteristic value is increased or decreased at a fixed ratio, and select a transient internal characteristic value having a maximum sensitivity within the time history sensitivity as the predetermined transient internal characteristic value.

14. The characteristic value identification apparatus as claimed in claim 11 wherein the calculating means preliminarily calculate a variance deviation, as a time history sensitivity, to an initial value at a time when each transient internal characteristic value is increased or decreased at a fixed ratio, and select a transient internal characteristic value having the time history sensitivity similar to the error as the predetermined transient internal characteristic value.

15. The characteristic value identification apparatus as claimed in claim 13 wherein the calculating means simultaneously select a plurality of transient internal characteristic values having a different maximum sensitivity time as the predetermined transient internal characteristic value.

16. A virtual testing system which incorporates a functional model, as a virtual prototype, having an internal characteristic value identified by a characteristic value identification apparatus claimed in claim 11 comprising:

condition assigning means for assigning a driving operation condition and an environment condition to the characteristic value identification apparatus,

observation means for observing reproduction data obtained by the virtual prototype when the driving operation condition and the environment condition are assigned, and

evaluation means for evaluating an observation result of the observation means.

17. The virtual testing system as claimed in claim 16, further comprising another measurement means for measuring actual machine test data at a time when the driving operation condition and the environment condition are provided to an actual machine which forms a subject of the virtual prototype, and

re-identification means of the virtual prototype,

the evaluation means comparing an output of the measurement means and the observation result, and making the re-identification means re-identify the virtual prototype according to the comparison result.

18. The virtual testing system as claimed in claim 17 wherein a fixed virtual prototype is incorporated into a part of a drive system and a load system connected to the part as the virtual prototype, the testing means perform a test corresponding to the fixed virtual prototype, and the evaluation means at this time make the re-identification means perform a re-identification according to the comparison result.